

Demand Response Quick Assessment Tool (DRQAT)

The Demand Response Research Center (DRRC) developed the Demand Response Quick Assessment Tool (DRQAT) to advance demand response strategy development for large commercial buildings. This assessment tool predicts the energy and peak electrical demand savings, the economic savings, and the thermal comfort impact for various demand responsive strategies.

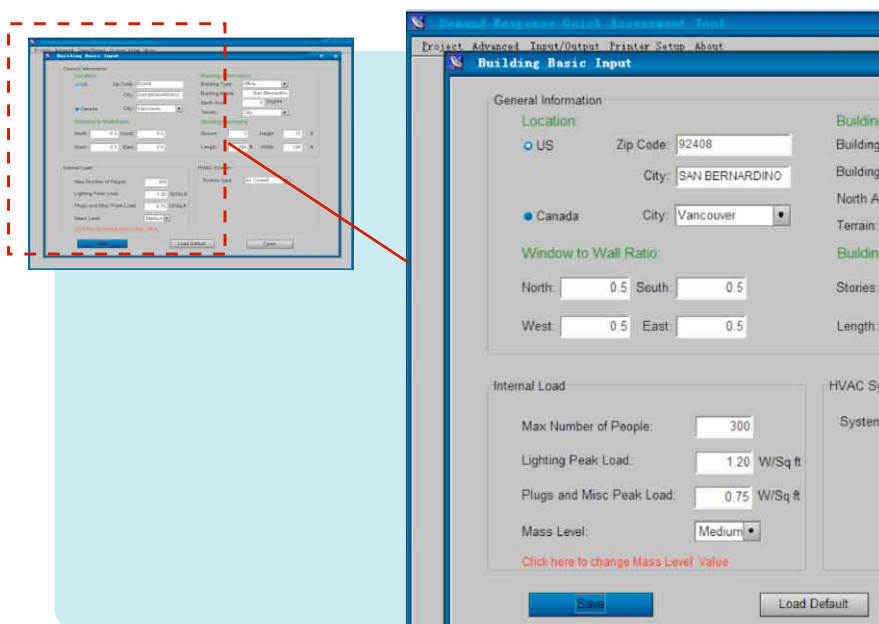


The Demand Response Research Center (DRRC) developed the Demand Response Quick Assessment Tool (DRQAT) to advance demand response strategy development for large commercial buildings. These buildings differ from small commercial buildings in terms of building materials and size, equipment, and utility rates. This tool is built on EnergyPlus¹ simulation

software. It incorporates prototypical buildings and equipment and allows users to specify a relatively small number of important parameters, to conduct a quick assessment of demand response strategies that utilize building thermal mass. The most recent version of the software is 5.0.0.

Since its early development, the tool has received wide acceptance among the DR community and has been used to develop DR estimations to support AutoDR deployments in Pacific Gas and Electric's service territory.

In 2010, new and improved features were added to the DRQAT. With funding from the Building Group at Natural Resource Canada's CanmetENERGY, an additional prototype building model was added, to expand the application of DRQAT to demand response programs in Canada. Moreover, a thermal energy storage system model was developed to evaluate the effect of demand response control strategies in buildings with thermal storage systems.



¹EnergyPlus is a whole building energy simulation program that engineers, architects, and researchers use to model energy and water use in buildings. <http://apps1.eere.energy.gov/buildings/energyplus/>

Benefits to California and the Nation:

- Reducing electrical peak loads has a huge economic and environmental benefit to California. This tool can easily be used to predict energy and peak electrical demand savings, economic savings, and thermal comfort impacts.
- The tool can be used to optimize various DR control strategies to achieve

maximum peak demand reduction while maintaining indoor occupant comfort and allowing the integration of various DR control strategies such as lighting control, temperature thermostat control, and HVAC control to meet whole building peak demand reduction goals.

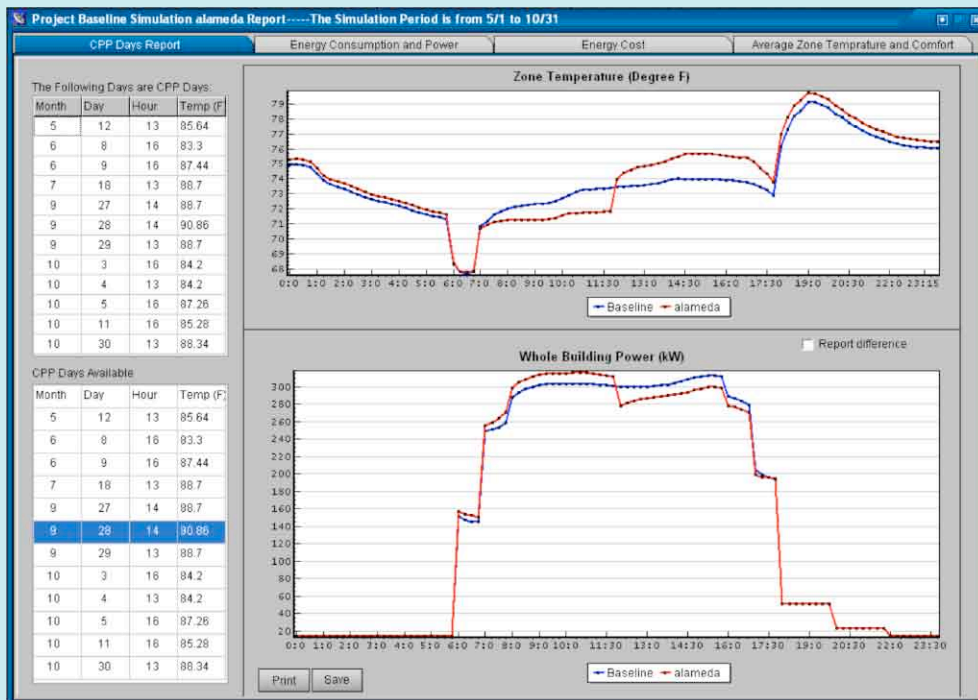
- DRQAT is designed to guide building operators in evaluating the potential for peak demand and economic cost savings, using various DR control strategies in commercial buildings across California.

- The tool allows for evaluating the effects of various DR control strategies in commercial buildings across different climate zones.

- Its performance has been tested and verified with eleven corporate office buildings located in San Bernardino, CA.

- The Federal Energy Regulatory Commission's National Action Plan refers to DRQAT as a tool that customers, states, utilities and demand response providers can use to identify DR strategies.

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Related Links:

<http://drcc.lbl.gov/tools-drqat.html>

Key OpenADR Articles and Materials:

R. Yin, P. Xu, M.A. Piette, S. Kiliccote, *Study on Auto-DR and Pre-cooling of Commercial Buildings with Thermal Mass in California*, *Energy and Buildings*, 42 (7) 2010, pp. 965-975

R. Yin, M.A. Piette, S. Kiliccote, K. Parrish, *Scenario Analysis of Peak Demand Savings for Commercial Buildings with Thermal Mass in California*, *Proceedings of 2010 ACEEE Summer Study on Energy Efficiency in Buildings*. August 15-20, Pacific Grove, CA



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